



UNITED STATES NAVY

## MEDICAL NEWS LETTER

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**HISTORICAL FUND  
of the  
NAVY MEDICAL DEPARTMENT**

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donations must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objectives stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute, please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

Treasurer, N. M. D. Historical Fund  
Bureau of Medicine and Surgery (Code 23)  
Department of the Navy  
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Committee

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be nor are they susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Procaine Amide

Procaine amide was introduced for the treatment of cardiac arrhythmias 6 years ago. Since then a number of studies with the compound have been reported. A review of the results may help in appraising the value of the drug as a therapeutic agent.

A variety of dosage schedules have been employed in treating cardiac arrhythmias. When procaine amide is administered intravenously, the rate of injection appears to be as important as the total dose. The use of electrocardiographic control and frequent recordings of blood pressure are essential for safety when procaine amide is given intravenously, but when administered slowly (50-75 mg. /min.), as much as 3 gm. has been given without untoward effects. It is well to stress that, in the absence of hypotension and electrocardiographic abnormalities produced by the drug, it may be given until the desired effect is achieved, but intravenous administration entails certain dangers because of sudden development of cardiac abnormalities. The intramuscular route provides greater safety and single doses of 0.5 to 1 gm. at repeated intervals have been satisfactory. The intravenous route should be reserved for those patients whose desperate condition requires immediate therapy.

The oral dose of procaine amide required to revert any particular arrhythmia is variable. An initial dose of 1 gm. followed by 0.5 to 1 gm. doses every 3 to 4 hours is adequate for many patients, but the total daily dose may reach 10 gm. to revert an arrhythmia or provide prophylaxis against recurrences. The usually effective dose is about 3 to 6 gm. /day, but if the desired effect has not been achieved after 48 hours, the dose should be increased, either by increasing the frequency or increasing the individual dose because a stable plasma level is reached after 24 to 48 hours. Toxic effects, such as nausea and gastrointestinal irritation on 5 gm. a day, may

occasionally be so pronounced as to prevent further administration, but many patients take this dose without any difficulty.

Articles published during these 6 years suggest that procaine amide is an effective antiarrhythmic agent whose major uses appear at present to be: (1) for the management of ventricular premature contractions whether due to intrinsic heart disease, digitalis toxicity, or unknown cause; (2) in the management of ventricular tachycardia, particularly when it is desired to use an intravenous agent; (3) for the treatment of nodal arrhythmias and recent atrial arrhythmias; (4) during the course of myocardial infarction as a prophylaxis against ventricular tachycardia and fibrillation once ventricular premature contractions are observed. The authors do not recommend its use routinely as a prophylactic agent in surgery or cardiac catheterization, because the drug does not appear to exert much control over extrasystoles due to mechanical stimuli.

That this compound was found, suggests that other compounds with these pharmacologic properties exist, some perhaps even more potent and less toxic than procaine amide. Certainly, a further search is warranted. (Kayden, H. J., Brodie, B. B., Steele, J. M., Procaine Amide - A Review: Circulation, XV: 118-124, January 1957)

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#### Hemoglobin C Disease

To the present time, seven different hemoglobins have been described, in addition to types A and F which may be identified by their physicochemical characteristics. These hemoglobins have been designated by the alphabet names S, C, D, E, G, H, and I. The occurrence of clinical syndromes associated with hemoglobins SC, SD, EE, GG, and with hemoglobins SC, SD, and SA as well as the combinations of hemoglobin S-thalassemia, hemoglobin S-congenital spherocytosis, and hemoglobin C-thalassemia have been described. With the exceptions of the sickle hemoglobin diseases, however, descriptions of the findings at postmortem examination in the hereditary hemoglobinopathies are not available.

This report describes the clinical course of a patient with homozygous hemoglobin C disease, together with iron kinetic studies performed before and after a one-month period of compound E administration, the findings at postmortem, and the results of limited observations of the electrophoretic pattern of myoglobin isolated from skeletal muscle.

Approximately 28 cases of homozygous hemoglobin C disease have been reported. These suffice to define the clinical picture as one of mild intermittent abdominal discomfort, occasional arthralgia, and intermittent mild jaundice which usually occurs in a Negro and is compatible with advanced age. In most of the reported patients, the complaints for which medical attention

was sought were unrelated to the hemoglobin C disease and the symptoms were rarely referable to the mild to moderate anemia present. Only two of twenty-eight reported patients failed to exhibit splenomegaly and all but two, who were of Italian and of German-Dutch ancestry respectively, were Negroes.

The laboratory findings are a mild to moderate, normocytic, normochromic or hypochromic anemia, a large number of target cells present in the peripheral blood smear, a decreased osmotic fragility, a modest reticulocytosis, and a normoblastic marrow. In all of the patients reported, the diagnosis has been established by the characteristic electrophoretic pattern of the abnormal hemoglobin.

The calculated rate of iron turnover and rate of renewal of red cells is approximately twice the value observed in the normal subject. This increased rate of red cell production was not, however, adequate to compensate for the rate of red cell destruction and to provide a normal concentration of erythrocytes in the peripheral blood. The substantial increase in plasma iron turnover rate and red cell iron turnover which was observed concurrently with the administration of compound E could represent variations inherent to the disease. That this is unlikely, however, is suggested by the long base line obtained prior to treatment, during which time, hemoglobin values did not reach the level obtained during compound E administration.

The pathologic findings which were of greatest interest were the pulmonary arterial thrombi. Vascular thrombi are known to occur in acquired hemolytic anemia, and in sickle cell anemia and its clinical variants, but has not been found in other types of hereditary intracorporeal hemolytic anemia. Diggs and others have postulated that the thrombi present in sickle cell anemia result from the intravascular sickling of the cells and subsequent mechanical blockage of small vessels and resultant local anoxia. At present, there is no similar known phenomenon in patients with hemoglobin C disease. The red cells in the tissues of this patient were indistinguishable from those in tissues of patients with type A hemoglobin. It may be suggested that the intraerythrocytic crystals or the folded red cell membrane described by others represent morphologic abnormalities which could initiate vascular damage. This seems unlikely, however, because these phenomena were not seen in this patient and there is no adequate explanation for the thrombi seen. (Jensen, W. N., Schoefield, R. A., Agner, R., Clinical and Necropsy Findings in Hemoglobin C Disease: Blood, XII: 74-81, January 1957)

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#### Use of Endotracheal Cuff

Despite almost universal acceptance of the endotracheal cuff and its obvious advantages, there is still some opposition to its use. Certain of

the objections appear to be based upon conjecture and impressions rather than on facts. Data on the cuff, save for details of construction, are lacking. A study to obtain data to support or refute arguments for or against the cuff seemed desirable.

Pressures necessary to inflate the conventional endotracheal cuffs and to effect a seal, when the breathing bag is compressed manually to develop pressures between 15 and 20 mm. of Hg in a circle system, range between 90 and 220 mm. of Hg. The wide variations in pressure are due to the differences in size of cuffs, the volumes of air necessary to inflate the cuffs, the distance between the wall of the catheter and the interior of the trachea, and the thickness and elasticity of the rubber composing the cuffs. Most of the pressure is expended in overcoming the elasticity of the rubber. The pressure exerted by the cuff on the tracheal wall varies between 10 and 15 mm. of Hg when inflated to hold pressures ranging between 15 and 20 mm. of Hg in the breathing bag.

The possibility of severe trauma, contusions and laceration of the trachea, bronchi, or alveoli by rupture of a cuff under ordinary usage has been grossly exaggerated. Ordinarily, less than 10 ml. of air are necessary to inflate most cuffs. Volumes of 40 ml. or more are necessary to cause rupture. Intracuff pressures, when such volumes are used, exceed 1000 mm. of Hg. Rupture of cuffs under such circumstances caused no discernible trauma to the trachea, bronchi, or lung of dogs.

The incidence of cardiac arrhythmias, and reflex circulatory disturbances is no greater with cuffed than with uncuffed catheters. There is no correlation between the act of inflating the cuff and the development of cardiac arrhythmias.

The cuff is 100% effective in preventing the aspiration of gastric contents from the pharynx into the trachea. The pack does not assure against aspiration. The incidence of aspiration when the pack is used is identical to that which occurs when intubation is done without a pack or a cuff.

The routine use of a single sized endotracheal catheter for all patients, for example, a 32F, without a cuff results in a decrease in minute volume exchange and an increase in ventilatory effort. This resistance increases progressively as the diameter of the catheter is decreased in an airway of constant internal diameter. Under similar circumstances, using a catheter with an inflated cuff, a simultaneous increase in ventilatory effort corresponding to a negative pressure of 10 mm. of  $H_2O$  and a reduction of minute volume exchange of 7% occurred when a 30F catheter was used. The negative pressure which developed using a 40F was 2.5 mm. of  $H_2O$  and the decrease in minute volume exchange was less than 1%.

Pooling of secretions between the tracheal wall and catheter in the area distal to the inferior edge of the cuff occurs only when the steep head-down position is used and the edge of the cuff is at an appreciable distance from the end of the catheter. (Adriani, J., Phillips, M., Use of the Endotracheal Cuff-Some Data Pro and Con: Anesthesiology, 18: 1-14, January-February 1957)

Dental Local Anesthetic Solutions

The status of local anesthetics used commonly by injection in dentistry may be summarized as follows:

1. There is good reason to doubt that vasoconstrictors in dental local anesthetic solutions have caused any fatalities, despite the very widespread use of such solutions on all kinds of patients. This does not mean that epinephrine in these solutions is harmless, but in the case of such a widely used and well studied drug as epinephrine, the lack of reported fatalities is reassuring.

2. In those extremely rare instances when injected local anesthetics may have caused death, the anesthetic drug was perhaps responsible rather than the vasoconstrictor. The psychophysiologic stress attending the injection or the other treatment could have a greater damaging effect than the drugs administered.

3. The presence of a vasoconstrictor protects the patient against systemic effects of the anesthetic drug by two mechanisms. First, the vasoconstriction limits diffusion of the anesthetic into the blood stream. Second, the vasoconstrictor counteracts some of the systemic actions of the anesthetic. It may enhance others.

4. When systemic effects of procaine solutions with and without epinephrine have been compared experimentally, slight, but clinically insignificant differences in arterial blood pressure and pulse rate have been observed. Such differences are much less than the endogenous sympathomimetic effects.

5. In certain situations which arise in the practice of medicine, one vasoconstrictor drug may be distinctly preferable to another. However, there is little clinical basis upon which to express a preference for one vasoconstrictor over any other for use in dental local anesthetics.

6. There is not sufficient knowledge upon which to base precise recommendations with regard to safe amounts of vasoconstrictor or optimum rate of injection in either normal or abnormal dental patients. The literature reveals that, depending upon the site, intraoral injections are likely to be intravascular in about 2 to 6% of cases if ordinary non-aspirating cartridge syringes are used. The effect of intravenous administration of local anesthetic solutions is, therefore, a pertinent subject for investigation.

The investigation here reported was designed to detect differences in systemic effect between 2% procaine hydrochloride solutions with and without epinephrine 1:50,000. A battery of physiologic criteria was employed to determine the actions exerted by the epinephrine systemically. Data were obtained in 56 experiments involving 19 dental student subjects who were given no other treatment and who were kept in a resting state during the experiments.

This controlled investigation conducted on a blind basis did not reveal clinically significant differences in systemic effect between 2 cc. doses of 2% procaine hydrochloride solutions with and without epinephrine. Tracings from the finger plethysmograph, pneumograph, electroencephalograph, and electrocardiography and data on blood pressure were used as criteria.

Psychologically induced systemic effects were observed. (Wallace, D. A., et al., Pharmacology and Therapeutics - Systemic Effects of Dental Local Anesthetic Solutions: Oral Surg., 9: 1298-1303, December 1956)

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### Endotheliomyelosis

Even without disseminating bacterial embolisms, it has long been suspected that a localized focus of infection may produce widespread disease manifestations, especially in connective tissue, joints, the cardiovascular system, and the kidneys. However, clarification of this field has been greatly handicapped by three circumstances: (1) In clinical medicine, not every infected focus is accompanied by such distant manifestations; (2) In experimental medicine, no reliable method was available which would have permitted the consistent reproduction of the focal syndrome; (3) Even when a localized infection produces a generalized syndrome of this type, the removal of the focus does not always result in a cure of the distant disease manifestations. This lack of a reliable technique for the production of the focal syndrome especially handicapped experimental research in this field. To elucidate the pathogenic mechanism of a malady which cannot be produced in animals at will, is extremely difficult. The authors have endeavored to perfect such an experimental technique which they describe; they also review the salient points which had come to light so far concerning the focal syndrome.

With regard to the syndrome of endotheliomyelosis, this type of analytic work has merely begun. However, a few interesting facts have already come to light:

1. It has been possible to show that, in rats not sensitized by unilateral nephrectomy and an increased sodium chloride intake, focal infection is still capable of producing endocarditis and myeloid tissue proliferations, but the renal lesions are much less evident and there is no, or only very slight, polyuria.

2. As might be expected, adrenalectomized animals are extremely sensitive to focal infection; mortality among them is high even if comparatively large doses of corticoids are given as substitution therapy. In maintaining life, cortisol acetate (COL-Ac) is much more effective than DOC-Ac, and the best results are obtained by combined treatment with COL-Ac + DOC-Ac. Apparently, both mineralo- and glucocorticoids

play important roles in maintaining the resistance of animals so treated. Yet, in the authors' experience, even combined administration of the two types of corticoids did not equal the efficacy of intact adrenal tissue because it never succeeded in restoring the resistance of adrenalectomized animals to the high tolerance level of intact rats. It is possible that hormones other than DOC-Ac- and COL-Ac-like substances are necessary for optimum resistance. Perhaps the characteristic PAS-positive granules in the cortical cells of rats with the focal syndrome reflect the biosynthesis of some special corticoid.

3. In animals with intact adrenals, STH greatly facilitates the production of endotheliomyelosis by various agents.

4. The structure of the pathogenic focus is obviously of the greatest significance. This is clearly indicated by the fact that various contaminated protein solutions which are ineffective when injected subcutaneously as such become highly efficacious when administered with adjuvant. It is also noteworthy that even sudden flooding of the blood with such contaminated proteins by intravenous injection does not elicit the syndrome of endotheliomyelosis, it merely produces multiple abscesses as a result of septicemia. This is particularly noteworthy because the only other reliable means for the production of acute endocarditis in the rat is the injection directly into the blood of various types of streptococci. Even these germs produce endocarditis with any degree of regularity only after intracardiac inoculation. When injected intravenously, endocarditis is obtained only if the animals are previously exposed to high altitude—a procedure which can produce some degree of endocardial damage in itself.

5. A great deal of evidence has been accumulated in the literature to show that Group A hemolytic streptococci plays a specific role in producing rheumatic fever and cognate lesions in man and in experimental animals. In this respect, it is significant that, although contaminated protein solutions contained a variety of microorganisms (*Escherichia coli*, *Achromobacter*, *Pseudomonas pyocyanea*, *Klebsiella*, *Proteus*, *Paracolobactrum*), it was impossible to demonstrate the presence of any streptococci in the most active preparations.

6. The distant effects of a pathogenic focus may outlast its existence. Periarteritic changes may develop after discontinuance of a transitory treatment with contaminated casein. Occasionally, the authors noted that polyuria may continue indefinitely after the contents of an infected focus are eliminated through the skin and nothing but a scar remains. Such vascular and renal changes are then truly "metafocal" in the same sense as certain cardiovascular and renal changes developing after discontinuance of a transitory corticoid treatment are "metacorticoid."

The data clearly indicate that the structure of the infected focus plays a decisive role in determining whether the syndrome of endotheliomyelosis

will result from infection. The authors are of the opinion that, in this syndrome, a true simile of a type of focal infection exists. To this time, their main endeavor has been to develop an experimental technique which would permit the consistent reproduction of a focal syndrome. This has been accomplished, but their procedures are still largely empirical. Further work will now have to show what pure microbial cultures or microbial products are capable of producing such systemic reactions, what topical-adjuvant procedures are most efficacious, and what host responses (hormonal reactions, serologic responses, et cetera) are involved in the pathogenesis of the focal syndrome. (Selye, H., Bois P., Endotheliomyelosis - An Experimental Model of the "Focal Syndrome": *Oral Surg.*, 10: 37-50, January 1957)

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#### Chronic Hypercortisonism in Arthritic Patients

In the relatively brief period of 6 years of intensive clinical and biochemical investigations, the great potency of cortisone, corticotropin, and related adrenocortical hormonal preparations has been demonstrated. However, knowledge as to how the various effects of these hormones are mediated and how they may be used therapeutically to best advantage and with greatest safety is still incomplete.

The therapeutic use of cortisone, or its analogues, or corticotropin must still be based on careful consideration of both the anticipated benefits and the potential disadvantages of the hormone for each disease and each patient. These considerations become especially important when long-term hormonal treatment is undertaken. The calculated acceptable (or unacceptable) risk embodied in the decision to use (or not to use) hormonal treatment has been epitomized in the word "hypercortisonism."

In this presentation the authors (1) emphasize the significant features of hypercortisonism in patients with rheumatoid arthritis, and (2) describe certain principles and practices helpful in the management or prevention of chronic hypercortisonism in such patients.

Chronic hypercortisonism results from prolonged overdosage with cortisone or related preparations, even though the overdosage is mild and perhaps unsuspected and usually develops insidiously over weeks or months during use of excessive maintenance doses in long-term treatment of chronic diseases. The degree and rate of development of chronic hypercortisonism vary with the amount of hormone, duration of administration, age and sex of patient, and possibly with the severity of the systemic reaction of the disease. It may develop in as short a time as 2 months from beginning of treatment, especially in susceptible patients, or it may not become apparent until after a year or more of treatment.

Because treatment is at best slow, difficult, and perhaps inadequate owing to limited understanding of the biochemical and other mechanisms of its development, prevention of hypercortisonism is important.

Measures include appropriate selection of patients and a stage of the disease suitable for hormonal therapy, acceptance by patient and physician of improvement compatible with safe dosage of the hormone, regular times of administration and, usually, regular divisions of doses of the hormone throughout the 24 hours, individualization of dosage at all times, and other treatment as indicated to supplement the hormonal therapy.

The maximally tolerated total daily doses of the hormones vary with the age and sex of the patient and as experience with long-term hormonal therapy has increased, physicians' estimates of this dose have been lowered.

Currently recognized limits of dosage needed to avoid chronic hypercortisonism in patients with rheumatoid arthritis are summarized in a table. As illustrated with use of cortisone, these doses for children are less than 10 mg. daily, for adolescents 10 to 15 mg. daily, for postmenopausal women, 20 to 30 mg. daily, for premenopausal women, 30 to 37.5 mg. daily, and for adult men 37.5 to 50 mg. daily. Proportionately lower doses apply for the use of hydrocortisone, prednisone, prednisolone, or corticotropin. Occasionally, a patient may tolerate doses that are slightly more or less than these amounts. It is desirable to avoid excessive doses of cortisone or related steroids or corticotropin at the start of, as well as during, long-term hormonal treatment. (Slocumb, C. H., et al., Diagnosis, Treatment, and Prevention of Chronic Hypercortisonism in Patients with Rheumatoid Arthritis: Ann. Int. Med., 46: 86-97, January 1957)

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#### Roentgenologic Aspects of Motor Vehicle Accidents

The medical aspects of motor vehicle accidents involve consideration of factors governing normal and abnormal phases of motor transport. The latter includes preclinical, paraclinical, and postclinical elements. It means accident prevention, physical factors in injuries, aids to recovery and ultimate rehabilitation. Radiology pervades this entire field and interlocks with every facet of it.

From the standpoint of degree of morbidity, motorist casualties which are hospitalized may be classified as follows: 45% are hurt in a more or less minor to moderate degree; 45% are moderately to more severely injured; and 10% are severely to dangerously injured. Attention is called to the fact that the mortality rate derives from the latter category almost entirely. This means that any reduction in the mortality of victims who reach the hospital must be attained in this subgroup. This type of patient usually needs a team approach to diagnosis and management. Others, for the most part, can be

handled successfully by the first physician who is called, provided he has sufficient versatility and experience.

The mortality differentials in motorist casualties should be further clarified and understood. About 15% die outright at the scene of the accident. Of the 85% who reach the hospital, about two-thirds die within the first 48 hours, the rest at varying periods of time afterwards. The immediate deaths are due to primary irreversible shock to vital functions. Deaths which occur soon afterwards are also due to primary shock. This is fairly well known and clinically appreciated. Not so well appreciated is the fact that so called secondary shock is responsible for most of the deaths later on. The latter involves considerations of a number of direct and indirect post-traumatic complications (sometimes not distinguished from the primary injuries). These include fat embolism, pulmonary congestive states (and pneumonia), nephrosis, infections, operations, and postoperative complications, and even degenerative changes in the body organs.

The rapidity with which secondary shock appears and encroaches upon the factors of safety of the human body are seldom fully recognized and combated to the fullest extent possible. This situation begins with the admission of the victim in the outpatient department of the hospital. This is the place to think about secondary as well as primary shock.

From the standpoint of primary shock, chief attention is focused on the maintenance of the circulation (and arterial volume) and the provision of an adequate airway. In anticipation of secondary shock states later on, adequate screening of the head, chest, and abdomen by roentgenograms should be done (as baseline or diagnostic) in all severely and/or dangerously injured persons. This calls for some changes in policy with respect to these patients who are usually considered to be too ill for any extended types of diagnostic ventures. Yet this is the time, or very shortly after admission, to establish baseline data for the ultimate, as well as the immediate, care of the dangerously injured individual. Even so the dynamic concept of primary shock is that the patient is getting either better or worse all of the time, but is never in a state of suspended animation. Once primary shock is being treated, there is no point in further procrastination in regard to diagnostic (usually roentgenographic) procedures upon which the patient's life may depend.

There is no rule of thumb, nor should there be. These risks will have to be taken—as they are in anesthesia and surgery—and will likewise be minimized with rapid and deft handling of these people early after admission to the hospital. It should be evident that first aid sets the pace and pattern for emergency care. Also, good emergency care can set the pace and pattern of the definitive diagnosis and management of the more severely injured casualties.

The critical factors in fatal cases are the internal injuries. It is becoming increasingly evident that those of the chest are superseding those of the head. This statement is strongly fortified by the fact that in a series of 30

fatalities studied at autopsy, 10 cases (14 injuries) received injuries of the pericardium, heart, and great vessels. Despite this frequency at autopsy, such injuries are seldom diagnosed or even suspected in life. In this series, this was suspected in at least 2 cases before death. These were not substantiated roentgenologically simply because too much reliance was placed upon portable techniques instead of regular fluoroscopic ones which would have demonstrated the malfunctioning heart.

The vast majority of residual complaints from motor vehicle accidents involve the motor-skeletal system, many of which are complicated by medicolegal factors. These cases require a most careful differential diagnosis. Most of these cases are seen in office practice and, therefore, help to bridge the clinical gap between hospital and later experience.

Analysis of such cases from the writer's practice showed a series of 350 cases, two-thirds of which complained of neck, low back, or combined neck and low back pain. The latter included 91 cervical, 94 low back, and 45 combined disabilities. About one-half were drivers with the remainder divided between those in the front and back seats (about one-third in the latter area). Accident configuration was most constant for the cervical group. Otherwise, all kinds of impacts were responsible for the alleged personal injuries.

Medical concern is growing in regard to the increasing toll of life and limb exacted daily on the highways. With the advent of epidemiologic techniques and methods of studying these accidents, the evolution of medical participation may be expressed as advancing from a "do-it-yourself" attitude to a "do-it-together" plan of medical action. The role of the radiologist, henceforth, will become more specific than it already is, both in the solitary and team approaches to problems of medicine. His responsibilities increase with better knowledge of the living morbidity and autopsy pathology of motorist casualties because increasing knowledge impresses clinical rather than surgical challenges alone, as has been thought to be the case in the past. This means alertness toward therapeutic conservatism as well as toward positive surgical intervention which points up the necessity for more participation by internists in the severely injured motorists. There is no intent to subordinate the surgical aspects of this problem by this statement. On the contrary, it should be a guide toward ever greater accuracy in diagnosis and therapeutic priorities. (Kulowski, J., Roentgenologic Aspects of Motor Vehicle Accidents: Am. J. Roentgenol., 77: 115-129, January 1957)

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The printing of this publication has been approved by the Director of the Bureau of the Budget, 16 May 1955.

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The Evolution of the USS Pandemonium

The old adage, "Big oaks from little acorns grow," was recently demonstrated at the Biological and Chemical Warfare Defense School at Treasure Island, Calif. In July 1955, an old deckhouse served as a mockup for shipboard training in biological and chemical warfare counter-measures. Today, the deckhouse has grown into the USS Pandemonium, a full-scale mockup of a 173 PC.

The Pandemonium has been designed throughout for the teaching of all phases of ABC shipboard defense and recovery techniques. It was constructed from a set of general plans of the PC-1170 and from photos of the PC-116.

With the financial aid of the Bureau of Ships, much of the equipment for the mockup was obtained through the wholehearted cooperation of scrap and salvage units at Treasure Island, the San Francisco Naval shipyard, the Naval Supply Center at Oakland, and the Mare Island Naval Shipyard. Other equipment was obtained from various activities with the vigorous support of the Equipment and Facilities Section of the Training Division, Bureau of Naval Personnel.

Labor on the ship was provided by all staff members of the school, supplemented by working parties of transient personnel from the Naval Receiving Station at Treasure Island. Practically every metalworking specialist passing through the Receiving Station since construction began has worked a little on the PC.

When completed about February 1957, the ship will have many special features to facilitate teaching all phases of ABC warfare counter-measures. Drill spaces will include a classroom area, a large shower space, and a storage area. The Bureau of Medicine and Surgery will furnish funds for outfitting laboratories aboard the ship for training medical officers in biological warfare identification techniques. The school staff will complete installation of fire mains, a water washdown system provided by the Bureau of Ships, temporary electrical system, and sound-powered phone circuits. Throughout the whole construction, program drills have been conducted on the ship.

"Cumshaw" deals, scrap, and salvage materials, plus the support of numerous naval activities, have turned the little acorn into a full scale mockup for realistic ABC training. (Naval Training Bulletin, December 1956)

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Symposium - First Naval District

The Fifth Annual Military Medico-Dental Symposium under the auspices of the Commandant, First Naval District, will be held at the U.S. Naval Hospital, Chelsea, Mass., and civilian institutions in Boston, 20 - 22 March

1957. The theme of the Symposium is The Worldwide Significance of the Preventive Aspects of Military Medicine and Dentistry. The program has been planned to provide the Reserve and Regular Medical Department officers with information regarding current concepts in varied fields of endeavor in the Medical and Dental Services of the Armed Forces.

The meeting on the first day will be conducted at the U.S. Naval Hospital in Chelsea. On the morning of the second day, a tour of the School of Public Health, Harvard University, will be conducted by Doctor John C. Snyder, Dean of the School, following which lectures will be given at the Jimmy Fund Auditorium. The third day, the lectures will be given at the Jimmy Fund Building, the Joslin Auditorium of the New England Deaconess Hospital, and the U.S. Naval Hospital, Chelsea.

Among prominent guests and speakers on the opening day are the Honorable Frank Berry, Assistant Secretary of Defense (Health and Medical); Rear Admiral Bartholomew W. Hogan, MC USN, Surgeon General of the Navy; Major General Silas B. Hays, MC USA, Surgeon General of the U.S. Army; Doctor Howard Root, President, Massachusetts Medical Society; Captain Shields Warren, MC USNR, Professor of Pathology, Harvard Medical School; Doctor Chester S. Keefer, Director, Boston University School of Medicine; and Agnes Ohlson, R.N., President, American Nurses' Association. Captain R. Cannon Eley, MC USNR, Chief of Isolation Service, Children's Hospital, Assistant Clinical Professor of Pediatrics, Harvard Medical School, is serving as general chairman of the Symposium.

This Symposium has been approved for retirement point credit for those in attendance who are on the Active Status List in the Armed Services Reserve Program, provided they register with the authorized Military Representative assigned the duty of recording daily attendance. Programs and additional information may be obtained by addressing the District Medical Officer, First Naval District, 495 Summer Street, Boston 10, Mass.

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#### Radiobiology Course

Announcement has been made by the Armed Forces Special Weapons Project of a course for Medical and Medical Service Corps officers in Radiobiology to be given at Reed College, Portland, Ore., and activities as indicated below. The course will convene in July 1957 and end in May 1958. The tentative schedule for the course is:

Part I Academic Training

Reed College, Portland, Ore.  
July - December 1957 (24 weeks)

Part II Industrial Health Physics

Hanford Works, Richland, Wash.  
January - February 1958 (6 weeks)

## Part III Special Medical Orientation

- a. Nevada Test Site, Nev.  
February 1958 (4 days)
- b. Sandia Base, Albuquerque,  
N. M.  
March-May 1958 (2 weeks)

## Part IV Mass Casualty Course

Walter Reed Army Institute of  
Research, Washington, D. C.  
March - May 1958 (6 weeks)

The objective of this training is to provide Medical and Medical Service Corps officers with sufficient technical background so that they may serve as Staff Advisors in all phases of the medical aspects of atomic defense; as advisors in the medical problems associated with the use of atomic reactors for power purposes; as instructors in the various service training centers; and as staff officers with radiological safety backgrounds. Continuing progress in the field of nuclear energy and atomic research means an increasing need for Medical officers and Medical Service Corps officers trained in radiobiology.

Requests are desired immediately from Medical and Medical Service Corps officers of the regular Navy and the Naval Reserve in the ranks of Commander and below who are interested in this field of study. In the case of Medical Service Corps officers, the individual should (1) have had previous training in the basic sciences, and (2) be acceptable for transfer to the Allied Science Section of the Medical Service Corps. In accordance with BuMed Instruction 1520.7 of 4 August 1954, each request for this course must contain the applicant's agreement to serve for a period of two (2) years after completion of the course, or for two (2) years following completion of any obligated service, whichever is longer. Requests must reach Bureau of Medicine and Surgery prior to 1 April 1957, and may be made by dispatch if the time element involved requires such action. Dispatch requests must be confirmed by letter. (SpWpnDefDiv, BuMed)

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NavMed-X and Xa to be Discontinued

Changes to Chapter 23, Manual of the Medical Department, were approved by Assistant Secretary of the Navy, Albert Pratt, which cancel the requirement for (1) preparing and maintaining a NavMed-Xa, Recruiting File Record, for each person examined physically for Navy or Marine Corps enlistment or reenlistment and (2) preparing and submitting the NavMed-X, Recruiting Statistics, to the Bureau annually. These changes will appear in future page changes to the Manual of the Medical Department and will be retroactive to 1 January 1957. (StatDiv, BuMed)

From the Note Book

1. Correction: In Volume 29, Number 3, Page 3, dated 1 February 1957, in fifth paragraph of article "Lineal Positions" insert period after the word "law" and delete remainder of sentence. (PersDiv, BuMed)
2. The conference of fiscal and administrative officers, tentatively scheduled for April 1957, has been canceled. Commanding officers will be informed of the change in plans and alternative means of accomplishing the aims of the conference will be offered. (ComptDiv, BuMed)
3. The Public Health Service awarded 104 research grants totaling \$1,464,881 in the last 6 months of 1956 to support research studies in water pollution, water supply, and air pollution. Of the 104 grants, 74 (totaling \$713,972) are for research in water supply and water pollution. Thirty-six of the grants are for new projects, and 38 are for the continued support of projects already under way. These research grants include awards to investigators working in 43 institutions in 27 States and the District of Columbia. (PHS, HEW)
4. Bezoars, although fairly rare, are likely to pose clinical problems when they enter into the differential diagnosis of disorders causing abdominal pain or when they are encountered by chance in x-ray examination of the abdomen. A bezoar is a bulky mass of a type of foreign material occurring in the stomach or intestines. It is prone to be a cause of acute or chronic disease as a result of impairment of the function of the alimentary canal. (Ann. Int. Med., January 1957; A. E. Haley, M. D.) (See News Letter, Vol. 18, No. 9, p. 21)
5. Twenty-seven cases of multiple primary malignancies of the genito-urinary tract found among 4000 urological neoplasms are presented. All were proven to have two different malignancies. In 12 cases, the additional malignancy was an incidental pathological finding and in the remainder, the two conditions were suspected clinically. (J. Urol., January 1957; M. M. Melicow, A. C. Usen)
6. Detection of focal anatomical abnormalities in the liver is facilitated by radioisotope localization studies followed by needle biopsy at the site of the increased radioactivity. This combined approach is superior to either technique alone, permitting selection of site rather than random insertion of the needle. A normal liver biopsy in the presence of markedly increased radioactivity in a localized area suggests that the focal lesion is beyond the reach of the needle. (Am. J. Med. Sci., January 1957; CDR C. M. Leevy, MC USNR; LT J. Greenberg MC USNR)
7. The dental profession should prepare to serve in any national disaster by learning how to administer casualty services outside of the mouth. They

should know what to do for general bodily injuries. This will require training in local dental society casualty care programs and in hospitals, in student training in all dental schools and in the active and reserve forces of the Armed Services. (J. A. D. A., February 1957; R. W. Bunting, D. D. S.)

8. A report is presented in which a necrotic, metastatic tumor deposit was discovered in the mandibular condyle of a patient with widespread skeletal metastases resulting from a primary carcinoma of the breast. (O. S. O. M. & O. P., December 1956; H. J. J. Blackwood, B. D. S., London)

9. Decortication can be applied widely in a number of conditions, tuberculous, nontuberculous, or malignant, stemming from imprisoned lung either with or without a pleural space. The final results of decortication depend, not upon the disease for which decortication was done, but upon the two factors of the functional potential of the underlying imprisoned lung and the technical success of the surgical procedure. (J. Thoracic Surg., January 1957; D. H. Waterman, M. D., et al)

10. Recurrence of carcinoma of the cervix after surgery does not necessarily imply a hopeless situation. Surgical excision offers the best hope of cure, but only for those recurrences that occur centrally and that can be completely removed. Radiation therapy can cure the superficial central recurrence and is the only mode of therapy that can be offered for the lateral pelvic wall recurrence. (Cancer, November-December 1956; W. W. Daniel, M. D., A. Brunschwig, M. D.)

11. The clinical entity known as "discoid lateral meniscus" was investigated to determine its etiology and to explain the mechanism of the click which is frequently observed during flexion and extension of the knee joint. Inasmuch as treatment consists in removal of the discoid meniscus, an attempt was also made to find a more direct method of removal which would be more consistent with the surgical anatomy of this condition. (J. Bone & Joint Surg., January 1957; E. B. Kaplan, M. D.)

12. Gasserian ganglion cell destruction by injecting boiling water into this nerve center has been effective in safely stopping the pain of tic douloureux in 96 of 100 patients. (Arch. Neurol. & Psychiat., January 1957; R. Jaeger, M. D.)

13. If satisfactory cosmetic results in the treatment of facial injuries are to be obtained, the following factors should be emphasized: early treatment and proper débridement of facial lacerations, complete hemostasis, use of fine skin suture material, and pressure dressings. (Arch. Otolaryng., January, 1957; J. B. Erich, M. D.)

14. In the older age group, gastric ulcers tend to be benign. Often, mild symptoms exist for years before a diagnosis of ulcer is made. Gastric ulcers tend to heal quickly, but are apt to recur. A healed gastric ulcer leaves little, if any, roentgenologic deformity as compared with the scarring and deformity of a duodenal ulcer. (Am. J. Roentgenol., January 1957; M. M. Klein, M. D., R. L. Bradley, M. D.)

15. Conservative treatment gave 85% satisfactory results in 154 patients with postphlebitic syndrome. This program requires careful patient education and cooperation, vigorous treatment of allied disorders, control of local infection, and elevation, compression, and exercise followed by progressive edema-free ambulation with compression. (Surgery, January 1957; J. C. Owens, M. D., L. L. Anderson, M. D.)

16. The authors believe that hypertrophic gastritis of the giant rugae type occurs more frequently in Japanese than in other races. Its differentiation from other pathologic lesions of the stomach, particularly malignancy, may at times be impossible without exploration, examination, and biopsy. (Surgery, February 1957; J. E. Strode, M. D.)

17. Seven cases of unusual cardiac deaths in patients undergoing mitral or aortic valve operations are presented, including production of ball-valve thrombus, undiagnosed Lutembacher's syndrome, traumatic removal of large atrial thrombus, embolization to the right posterior vertebral artery and a surgically ruptured chorda tendinea of a relatively patulous mitral valve. (Am. Heart J., February 1957; R. W. Barr, M. D., S. C. Sommers, M. D.)

18. The management of acute asthma is discussed in Arch. Int. Med., January 1957; H. D. Carryer, M. D.

19. The incidence, radiologic and pathologic features of fibroleiomyoma of the lung are discussed in Ann. Surg., January 1957; P. Crastnopol, M. D., W. D. Franklin, M. D.

20. The x-ray diagnosis of aneurysmal bone cyst is discussed in Radiology, January 1957; R. S. Sherman, M. D., K. Y. Soong, M. D.

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#### Board Certifications

##### American Board of Internal Medicine

LTJG John A. Benson (MC) USNR (Inactive)

LTJG Carl A. Berntsen, Jr. (MC) USNR (Inactive)

LTJG Russell S. Boles, Jr. (MC) USNR (Inactive)

American Board of Internal Medicine (continued)

LT William J. Burke (MC) USNR (Inactive)  
LTJG Norman D. Comeau (MC) USNR (Inactive)  
LTJG Edward B. Crohn (MC) USNR (Inactive)  
LT Vincent A. DeLuca, Jr. (MC) USNR (Inactive)  
LT James E. Fitzgerald (MC) USNR (Inactive)  
LT Joseph Florio (MC) USNR (Inactive)  
LTJG John R. Goldsmith (MC) USNR (Inactive)  
LT Andrew J. Laudano (MC) USNR (Inactive)  
LT Philip R. Lee (MC) USNR (Inactive)  
LT Paul R. McCurdy (MC) USNR (Inactive)  
LT John Ohnysty (MC) USNR (Inactive)  
CAPT Henry F. Page (MC) USNR (Inactive)  
LT David W. Parsons (MC) USNR (Inactive)  
LT John A. Roque (MC) USNR (Inactive)  
LTJG Marcus Schaaf (MC) USNR (Inactive)  
LT Nahum R. Shulman (MC) USNR (Inactive)  
LT William J. Taylor (MC) USNR (Inactive)  
LCDR John W. Walsh (MC) USNR (Inactive)

American Board of Neurological Surgery

CDR Gale G. Clark (MC) USN  
LTJG Raymond W. Hillyard (MC) USNR (Inactive)  
LTJG Bert H. McBride (MC) USNR (Inactive)  
LTJG Francis G. Reilly (MC) USNR (Inactive)  
LT Bob J. Rutledge (MC) USNR (Inactive)

American Board of Obstetrics and Gynecology

LT Edward Sattenspiel (MC) USNR (Inactive)

American Board of Otolaryngology

CDR Howard G. Billman (MC) USNR

American Board of Pathology

LT Thomas G. Price (MC) USNR (Inactive)

American Board of Preventive Medicine

CDR Jack W. Miller (MC) USN (Public Health)  
CAPT Moffitt K. Holler (MC) USN, Founders Group, Occupational Med.

American Board of Psychiatry and Neurology

LT Desmond G. Boyle (MC) USNR (Active)  
CAPT John M. Murphy (MC) USN  
LT Byron L. Nestor (MC) USNR (Inactive)  
LCDR Werner K. R. Welz (MC) USNR (Active)

American Board of Surgery

LT Robert L. Lasher (MC) USNR (Inactive)

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Recent Research ProjectsNaval Dental Research Facility, NTC, Bainbridge, Md.

1. The Hyaluronidase Activity of Saliva. I. Determination of Characteristics of Activity in Young Male Adults. NM 008 027.01, 1 December 1956.

Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Effects of Altered Acid-Base Balance on Adrenocortical Function in Anesthetized Dogs. NM 007 081.22.14, 27 August 1956.

2. Effect of CO<sub>2</sub> Exposure on Adrenal 17-Hydroxycorticosteroid Secretion in Unanesthetized Dogs. NM 007 081.22.15, 27 August 1956.

3. The Effect of Antimalarial Drugs on the Exoerythrocytic and Erythrocytic Stages of Blood-Induced Infections of Plasmodium Fallax in the Turkey. NM 005 048.01.11, 6 September 1956.

4. Some Statistical Problems Concerning Linear Macromolecules. NM 000 018.06.52, 12 September 1956.

5. Titration Curves and Ion Binding on Proteins, Nucleic Acids, and Other Macromolecules with a Random Distribution of Binding Sites of Several Types. NM 000 018.06.53, 12 September 1956.

6. The Acetylcholinesterase Surface. VII. Interference with Surface Binding as Reflected by Enzymatic Response to Turicine, Betonicine, and Related Heterocycles. NM 000 018.12.07, 4 October 1956.

7. Reaction Volume and Incubation Time as Variables in Diamine Inhibition of Acetylcholinesterase. NM 000 018.12.08, 4 October 1956.

8. Factors Influencing Host-Virus Interactions - Influence of a Cold Environment Coxsackie Virus Infection in Adult Mice. NM 005 048.23.02, 8 October 1956.

9. Hypothemia and Cerebral Vascular Lesions. II. Experimental Middle Cerebral Artery Interruption Followed by the Induction of Hypothermia. NM 007 081.30.04, 17 October 1956.

10. The toxicology of Cellulube 220: III. Experimental Toxicology. NM 005 054.01.01, 22 October 1956.

11. An Automitized Technique of Investigating Differential Sensitivity to Auditory Intensities. II. The Influence of Catch Tests. NM 000 019.02.03, 22 October 1956.

12. An Automitized Technique of Investigating Differential Sensitivity to Auditory Intensities. III. The Influence of Randomizing the Starting Point of the Stimulus Series. NM 000 019.02.04, 22 October 1956.

13. Some Evidence for Non-Competitive Reversible Inhibition of Acetylcholinesterase. NM 000 018.12.09, 2 November 1956.

Naval Medical Research Unit No. 3, Cairo, Egypt

1. Cardio-Pulmonary Studies in Bilharziasis of the Lung. A Preliminary Report. NM 007 082.34.01, August 1956.
2. Brucellosis in Egypt - A Review of the experience with Two Hundred and Twenty-Eight Patients. NM 007 082.11.08, August 1956.
3. The Insectivores of Egypt. NM 005 050.39.44, October 1956.
4. Ectoparasitic Laelapid and Dermanyssid Mites of Egypt, Kenya, and the Sudan. NM 005 050.29.09, October 1956.

Naval Dental Research Facility, Great Lakes, Ill.

1. Histologic Effects of Silver Nitrate on Human Dentin and Pulp. NM 008 013.10.05, November 1956.
2. Determination of Human Saliva Aldolase Activity. NM 008 013.12.07, December 1956.

Naval Medical Research Unit No. 4, Great Lakes, Ill.

1. A Comparison of the Reactivity of Influenza A and B Propagated in Cultures of Human Embryo Tissues and in the Allantoic Sac of the Chick Embryo. NM 005 051.26.01, 8 October 1956.

Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

1. Hemodynamic Response of the Dog to Pentobarbital Sodium. NM 006 014.04.05, October 1956.
2. The Effect of Dibenamine, Levarterenol, or Splenectomy upon the Course of Burn Shock in the Dog. NM 006 014.04.06, October 1956.
3. The Effect of Levarterenol upon the Estimated Hepatic Blood Flow of the Dog Following Hemorrhage. NM 006 014.08.04, November 1956.
4. Development of a New Field Type Galley Grease Trap. NM 005 052.38.01, December 1956.
5. Research Progress Reports - 1 January to 31 December 1956.

Naval Medical Research Laboratory, Submarine Base, New London, Conn.

1. Photometric Survey of the Red Lighting Installation on the USS Darter (SS-576) Memorandum Report 56-7. NM 002 014.08.11, 13 December 1956.

Naval School of Aviation Medicine, Pensacola, Fla.

1. Persistence of the Autokinetic Illusion in Persons with Bilateral Injury or Destruction of the Labyrinth of the Inner Ear. NM 001 110 100, Report No. 41, 12 July 1956.
2. The Effect of Linear Acceleration on the Oculogyral Illusion. NM 001 110 100, Report No. 42, 13 July 1956.
3. The Break-Off Phenomenon: A Feeling of Separation from the Earth Experienced by Pilots at High Altitude. NM 001 110 100, Report No. 43, 6 August 1956.

4. A Note on the Expressed Reasons for Preference for Duty in Jet Aircraft. NM 001 109100, Report No. 12, 12 August 1956.
5. Vertigo as a Cause of Pilot Error in Jet Aircraft. NM 001 110 100, Report No. 44, 15 August 1956.
6. Analysis of Basic Training Stage Grades for Multi-Engine and Single-Engine Aviators. NM 001 109102, Report No. 3, 24 August 1956.
7. The Ability to Reproduce Task Cues and the Ability to Perform the Task. NM 001 108 101, Report No. 2, 31 August 1956.
8. Ocular Pursuit of a Target Moving in an Apparent Circular Path. NM 001 110 102, Report No. 1, 4 September 1956.
9. The Measurement of Dynamic Visual Acuity While the Observer is Rotating NM 001 110 501, Report No. 11, 10 September 1956.
10. Changes in Psychophysiological Responses Produced by Delayed Speech Feedback. NM 001 102 502, Report No. 1, 28 October 1956.

Naval Air Material Center, Philadelphia, Pa.

1. Human Engineering Investigations of the Interior Lighting of Naval Aircraft. TED NAM EL 52004, 15 October 1956.
2. Report on Explosive Decompression of Rats to 65,000 Feet with Immediate Fixation at Altitude. NM 001 101 203, 25 October 1956.

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BUMED INSTRUCTION 6700.15A

1 February 1957

From: Chief, Bureau of Medicine and Surgery  
To: Distribution List

Subj: Medical and dental materials under cognizance of BuMed; instructions for protection during major overhaul or conversion of ships

This instruction provides instructions for the protection of medical and dental materials under the cognizance of the Bureau of Medicine and Surgery, during a period in which the vessel is undergoing extensive overhaul or conversion. BuMed Instruction 6700.15 is canceled.

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BUMED INSTRUCTION 6710.7C

1 February 1957

From: Chief, Bureau of Medicine and Surgery  
To: Ships and Stations Having Medical Personnel

Subj: Yellow fever vaccine; procurement of

Ref: (a) BuMedInst 6230.1, Subj: Immunization requirements and procedures  
(b) Art. 22-25, ManMed

This instruction sets forth the procedures to be used in the procurement of yellow fever vaccine, and redesignates the yellow fever vaccine stocking points. BuMed Instruction 6710.7B is canceled.

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BUMED INSTRUCTION 5101.1A

4 February 1957

From: Chief, Bureau of Medicine and Surgery  
To: Ships and Stations Having Medical/Dental Personnel  
Subj: Oxygen cylinders; precautions in storage, handling, and use of  
Ref: (a) NavMed P-5040 (1956) - Recommended Safe Practice for Hospital  
Operating Rooms - National Fire Protection Association - NFPA  
No. 56

This directive reemphasizes the serious potential fire and explosion hazards inherent in the use of oxygen cylinders. It also notifies addressees of the availability of a new Warning Tag for Medical Oxygen Equipment, DD Form 1191, which details safe practices for handling oxygen cylinders. BuMed Instruction 5101.1 is canceled.

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BUMED INSTRUCTION 1520.10

11 February 1957

From: Chief, Bureau of Medicine and Surgery  
To: Ships and Stations Having Medical Corps Personnel  
Subj: Application for residency training  
Ref: (a) BuMedInst 1520.7A of 14 Dec 1956  
(b) BuMedInst 1520.8 of 6 Feb 1956  
Encl: (1) Sample application

This instruction provides guidelines for the submission of individual applications for residency training.

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## SUBMARINE MEDICINE SECTION



### Diving Casualty Case Studies

#### Oxygen Supplied Scuba

Homemade oxygen supplied underwater swimming outfits are sometimes assembled by uninformed devotees of this new sport. The next stage is to convert an open circuit outfit to a closed circuit apparatus by using carbon dioxide absorbent canisters so the oxygen may be conserved and underwater time extended. Many of these enthusiasts either never heard of, or doubt the reality of, the dangers associated with this type of equipment. There are three principal dangers associated with such equipment: oxygen convulsions, anoxia, and carbon dioxide poisoning.

Oxygen poisoning occurs when high oxygen concentrations are breathed too long at too great depths. This is illustrated by -

Case No. 14. "This man was taking an oxygen tolerance test. After he had been on O<sub>2</sub> at 60 feet for 17 minutes, he had generalized convulsions with no warning. His O<sub>2</sub> mask was removed and he was brought to the surface. Convulsions lasted 2-3 minutes. Except for some mental confusion, he was found to have no unusual physical findings. After 15 minutes, his confusion cleared." (Reported by LT A. D. James MC USNR)

Anoxia which has a subtle onset and ends in unconsciousness occurs when the swimmer fails to purge the rebreathing bag adequately or replenish oxygen in good time. The oxygen atmosphere being breathed creates a partial pressure differential between the body and the bag. As a result, the nitrogen in the body passes into the bag by way of the lungs until the partial pressure in the bag and in the body are the same. This provides a volume of nitrogen in the bag sufficient to permit a full comfortable inhalation. As the swimmer continues, the volume of the oxygen in the bag decreases until oxygen deficiency occurs. To avoid this, it is necessary to empty the bag after a short period of breathing and to then refill with oxygen. This is spoken of as "purging the bag" and it must be done thoroughly and frequently early in the dive, less frequently later. As the swimmer continues, he must replace oxygen consumed from the bag by letting some in from the compressed oxygen source (flask). This is illustrated by -

Case No. 15. "After 35 minutes of moderate swimming on a simulated night sneak attack, he suddenly started noticing marked dyspnea. He felt the bag

and it seemed collapsed. He triggered the bottle with no response. Then he noted vertigo and lost control of his muscular actions. His buddy brought him to the surface, inflated his life jacket, and removed the face mask. His recovery was rapid and he never lost complete consciousness. He complained that his tongue "curled up on him" and that he had a headache afterwards. The outfit checked out all right except for a very low oxygen supply in the tanks. The diver said he was able to inflate the bag when he tried it after he was picked up and had recovered from his symptoms." Reported by LT R. E. Spiekerman MC USNR)

Comment: This case is complicated. It probably was a case of anoxia from exhaustion of the oxygen supply. There is possibly an element of carbon dioxide build-up from over-exertion.

Carbon dioxide toxicity most often results from ineffective absorbent canisters. This may be a matter of poor canister design, exhausted chemicals used in the canister, but most often is due to inadvertent wetting of the chemical. This latter circumstance introduces two complications: increased breathing resistance which increases work and CO<sub>2</sub> production; and failure of the chemical to absorb CO<sub>2</sub> efficiently. It is illustrated by -

Case No. 16. "The oxygen valve was found to be loose after a surface swim from shore to the diving boat during which his face mask was carried. (On this apparatus, the face mask is part of the equipment.) It is possible that water in the mask got into the canister prior to the dive through the defective valve. The valve was fixed after his first purge. (Refer to reason for purging under anoxia above.) He repurged three times and then commenced to dive. After 15 minutes in the water, swimming easily, he suddenly started threshing about and then lost consciousness. His buddy wrestled him to the surface, inflated his life jacket and removed his face mask. He quickly regained consciousness, but severe headache, weakness and nausea remained for about 30 minutes. Examination of the equipment revealed nothing unusual except a canister full of water. This might have happened after the accident."

Diagnosis. Probably CO<sub>2</sub> poisoning resulting from moist absorbent chemical rendered ineffective by water prior to the dive. (Reported by LT R. E. Spiekerman MC USNR)

Moral. Resist any impulse to build, or for that matter, use an oxygen-supplied underwater breathing apparatus. This equipment does have special military uses. Even the professional users get into trouble with it occasionally. It has associated hazards which place it beyond the scope of a piece of sports equipment.

Physicians who practice in the vicinity of a body of water where sport divers congregate need to know something about diving casualties. The U. S. Navy offers an 8-weeks course in diving for medical officers. For information, write to Chief, Bureau of Medicine and Surgery (Attn: Director, Submarine Medicine Division, Navy Department, Washington 25, D. C.)

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**DENTAL****SECTION**

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Dental Clinic Established in Yokosuka

SecNav Notice 5450 of 11 January 1957 established the U.S. Naval Dental Clinic at Yokosuka, Japan, as a shore activity assigned to the Operating Forces of the Navy. The clinic is under the military command of Commander, U.S. Fleet Activities, Yokosuka, unless otherwise directed by the Chief of Naval Operations and under the management control of the Bureau of Medicine and Surgery.

The mission of the newly established dental command is to provide dental care to U.S. military personnel ashore and afloat in the Yokosuka area and such other personnel as authorized by the Chief of the Bureau of Medicine and Surgery.

Captain Victor H. Le Clair DC USN has been designated as the first Commanding Officer.

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Installations where Water is Fluoridated

The Department of Defense endorses the adjustment of the fluoride content of communal water supplies at military installations where dependent children are in residence in conformance with accepted health practices. Many Navy and Marine Corps activities are using fluoridated water as a health measure.

The National Research Council has made the following statement regarding the merits and safety of fluoridation and defluoridation at military installations:

"The Committee on Dentistry of the National Research Council believes that there is sufficient scientific evidence of the merits of fluoridation of public water supplies to justify its use on military posts whenever feasible and especially where there is a child population in residence."

In the accumulated experience, there is no evidence that the prolonged ingestion of drinking water with a mean concentration of fluorides below the level causing mottled enamel would have adverse physiological effects."

Navy and Marine Corps activities at which water is fluoridated are listed:

USNRTC - Elmira, N. Y.	USNAS - Corpus Christi, Tex.
USNRTC - Poughkeepsie, N. Y.	USNAAS - Cabaniss Field, Corpus
USNRTC - Cromwell, Conn.	Christi, Tex.
USN Ammunition Depot - Earle, N. J.	USNRTC, NAS - Corpus Christi, Tex.
USNRTC - Perth Amboy, N. J.	USN & MCRTC - Port Arthur, Tex.
USNAS - Lakehurst, N. J.	USNRTC - Austin, Tex.
USNTC - Bainbridge, Md.	USNS - San Juan, Isle Grande, P. R.
USN & MCRTC - Winston-Salem, N. C.	USNS - San Juan, San Patricio Qtrs.,
USN Ammunition Depot - Charlotte, N. C.	P. R.
USNRTC - Charlotte, N. C.	USN RadSta - Martin Rina, P. R.
USNRTC - Wilmington, N. C.	U.S. Naval Shipyard, San Francisco,
USNRTC - Gainesville, Fla.	Calif.
USNRTC - Miami, Fla.	USNS - Treasure Island, San Francisco,
USNRTC - Shelby Park, Nashville, Tenn.	Calif.
USNRTC - Kingsport, Tenn.	Naval Radio Station - Dixon, Ga.
U. S. Navy Supply Corps School - Athens, Ga.	Naval Radio Station - Skaggs Island,
USNAS - Atlanta, Ga.	Calif.
USNRTC, USNAS - Atlanta, Ga.	Mare Island Naval Shipyard - Vallejo,
USN & MCRTC - Augusta, Ga.	Calif.
USNRTC - Tuscaloosa, Ala.	USNS - Tongue Point, Astoria, Ore.
USN & MCRTC - Oklahoma Cy., Okla.	Atlantic Terminal (USNS) - Coco Solo,
USN & MCRTC - Tulsa, Okla.	Rodman, C. Z.
	Title VIII Housing - Annapolis, Md.

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#### Dental Notes

BuMed Notice 6630 of 28 January 1957 - Report of Prosthetic Dental Treatment (Med-6630-1), Med Form L; discontinuance of. Purpose: to advise that after 31 March 1957 the Report of Prosthetic Dental Treatment, NavMed L, will no longer be required for local use or for submission to the Bureau of Medicine and Surgery.

Retirements - Captain Kenneth O. Turner DC USN was placed on the retired list of officers of the U. S. Navy on 1 February 1957 after serving more than 20 years of active service.

Captain Alvin H. Grunewald DC USN was placed on the retired list of officers of the U. S. Navy on 1 February 1957 after serving more than 22 years of active service.



## MEDICAL RESERVE SECTION

### Active Duty for Training

A new 14-day course in Medical Military Training is now available at the Naval Medical School, National Naval Medical Center, Bethesda, Md., commencing 11 March 1957.

This course has new subjects and new material and has been revamped to bring it up to date. It will exploit all aspects of military medicine, is designed to the requirements of Reserve Medical Department officers, and will utilize the recommendations and suggestions of previous classes.

The first week will be devoted to the medical aspects of special weapons and radioactive isotopes with particular reference to personnel casualties from atomic explosions. The second week will be devoted to professional topics of concern to military medicine which includes discussions on the Reserve Medical Programs of the Armed Forces. Eligible Naval Reserve Medical Department officer personnel may avail themselves of this training within quotas authorized for Naval Districts 1, 3, 4, 5, 6, 8, 9, and CnaResTra. Security clearance is not required. Messing facilities are available. BOQ facilities are limited on a first-come first-served basis. Public lodging may be obtained locally in hotels, motels, and tourist homes.

Interested and eligible Reservists should write or visit the Reserve Medical Program Officer of their Naval District for detailed information concerning this course and the obtaining of active duty for training orders.

A Reserve Research Nuclear Science Seminar whose theme will be Life Sciences and Atomic Energy will convene at the Brookhaven National Laboratory, Upton, Long Island, N. Y., 27 May 1957. All eligible Reserve Medical Department officer personnel may attend this seminar within quotas authorized for Naval Districts 1, 3, 4, 5, 6 and 9 with priority being given to members of the Reserve Research Program. Fourteen days active duty for training is authorized. The program will offer:

1. Certain fundamentals of atomic energy will be reviewed as a basis for the more technical talks in the field of life sciences.
2. Lectures will be presented on biomedical problems related to detonation of nuclear devices from both the military and civil defense aspects.
3. Radiation hazards from the detonation, close-in fallout and world-wide fallout, protective measures, decontamination, instrumentation; acute affects of penetrating radiation, betaburns of the skin, long-term

effects: internal absorption of isotopes, genetic effects, and handling of mass casualties.

4. The use of isotopes in medicine, diagnostic and therapeutic, and their use in biological and medical research will be discussed.

5. Prominent speakers from Brookhaven National Laboratory and other civilian as well as military organizations will participate.

6. Tours of radiation facilities and laboratories at Brookhaven will be conducted, in addition to motion pictures, informal consultations with investigators at laboratories.

Secret clearance is required and should be stated in the active duty for training orders.

Housing and messing is available at Brookhaven, except in the case of officers who bring their wives. In this case, information on nearby motels and other outside accommodations will be furnished upon request. Also available upon request is detailed information on train schedules, recreation facilities at Brookhaven, nearby south shore (ocean) and north shore (Long Island Sound), and on other items of general interest. Address requests for this information to the Commanding Officer, Naval Reserve Research Company 3-9, Brookhaven National Laboratory, Upton, New York. The Reserve Medical Program Officer of your Naval District will assist in obtaining active duty for training orders to this seminar.

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AMA Membership Available to Regular and Reserve Medical Officers

At a recent meeting of the American Medical Association, the bylaws were amended to provide direct service membership for Regular Navy Medical officers and Reserve Medical officers on extended active duty as follows:

"Service Members: Regular commissioned medical officers and commissioned medical officers of the reserve components on extended active duty with the United States Army, the United States Navy, the United States Air Force or the United States Public Health Service, who have been nominated by the Surgeon General of the respective services, and the permanent medical officers of the Veterans Administration who have been nominated by the Chief Medical Director, may become service members on approval of the Judicial Council. Such members shall have the same rights and privileges as Active Members but shall not be required to pay dues and shall not receive any publication of the American Medical Association except by subscription. Service Members shall retain

membership as long as they are on active duty, and thereafter if they have been retired in accordance with federal law and do not engage in active practice."

Accordingly, an appropriate list of Regular and Reserve Medical officers on extended active duty will be furnished the American Medical Association annually and membership cards will be forwarded each individual listed. Attention is invited to the fact that, although membership dues are not required, all American Medical Association publications must be obtained by subscription.

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## PREVENTIVE MEDICINE SECTION

### Bat Rabies

Since the country's first reported case of bat rabies occurred in Florida in June 1953, there have been 175 cases diagnosed in widely diverse geographical areas of the United States. Rabies in bats has been reported from Florida, Pennsylvania, Texas, California, Montana, Ohio, Louisiana, New Mexico, Georgia, Alabama, Utah, Oklahoma, Minnesota, New York, and Michigan. Four species of tree living or solitary bats and nine species of colonial or cave dwelling bats, all belonging to the insectivorous variety, have been implicated thus far. The greatest number of rabies virus isolations have been from the Mexican freetail bat (Tadarida mexicana) in southwestern United States.

A basic question is whether the disease has always been present in the insectivorous bats of the United States and we are only now discovering it, or whether it represents a recent northward invasion into this country from the known infected vampire bat rabies areas in Latin America. The latter possibility is a distinct one in light of the fact that the Mexican freetail bat overlaps with and, it is believed, shares the same caves with the vampire bat populations of Mexico. This species is known to migrate from deep in the interior of Mexico to the vast areas of southwestern United States. It is entirely conceivable that from this focus a chain of infection has been established through contact of various species of migratory bats and finally has

manifested itself in the wide bat-host spectrum and diverse geographical foci now being found.

The epidemiological question of perhaps the greatest importance is whether the bat represents an important reservoir of rabies in the United States. If present studies ultimately show this to be a fact, the problem is indeed a formidable one. A positive finding in this direction may show that these creatures are responsible for the perpetuation of the sylvatic disease. This hypothesis could explain some of the bizarre geographical and cyclic patterns observed in wild animal rabies and it is conceivable that such a reservoir type animal may be capable of setting off an explosive outbreak in widely separated areas of dense fox or skunk populations. Investigators are presently hard at work to answer the reservoir question.

Related to the problem of whether bats are important reservoirs for igniting epidemics of rabies in other animals is the matter of whether they can transmit the disease as symptomless or true carriers. It is known that vampire bats in Latin America are capable sometimes of transmitting the disease for long periods of time without showing signs of illness in themselves. If this is true also of our indigenous insectivorous bats, the problem becomes even more difficult because there would be no self-limiting mechanism to assist disease control specialists. A few preliminary findings have suggested an infectious carrier state as a possibility. For instance serum surveys on clinically well Mexican freetail bats in certain areas have shown that 15% of them show specific rabies antibodies, indicating the possibility of infection and recovery. Outside of vampire bats, recovery from rabies is virtually unknown in man or lower animals after symptoms appear. The preliminary findings which have suggested this phenomenon are by no means proof that it actually occurs. More investigation is required. (Report of Veterinary Activities, Veterinary Section, Communicable Disease Center, PHS, HEW, November 1956)

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#### Early Diagnosis of Tuberculosis in Childhood

This article points out that the medical profession in the past has placed too much reliance on clinical findings for early diagnosis of tuberculosis. To do this, they have depended upon symptoms and symptom complexes, many of which were not as dependable as was thought. For instance, erythema nodosum is often considered to be indicative of tuberculosis. While this may be so in Scandinavian countries where 95% of cases of erythema nodosum are associated with tuberculosis, in the United States, it is much oftener associated with rheumatic fever and occurs infrequently under any circumstances.

In the past, phlyctenular conjunctivitis was considered to be pathognomonic of tuberculosis, but in recent years it has been shown that it is

oftener due to offending allergens other than tuberculoprotein and that only a relatively few cases are actually due to tuberculosis.

The "tuberculosis symptom complex" of chronic cough, anorexia, and weight loss is also of little value for early diagnosis because these occur only in a portion of progressive cases.

Expiratory stridor and bitonal cough caused by bronchial compression may rarely be an aid to diagnosis of early tuberculosis. Persistent fever may arouse suspicion of tuberculosis.

"As a rule, however, the onset of primary tuberculosis is symptomless. In the Child Chest Clinic of the Medical College of Virginia there are two special groups of carefully followed patients. One hundred twenty-one of these are control or nonvaccinated patients in a BCG study which admits only children under 6 months of age. Another 79 are those included in the U.S. Public Health Study concerning the efficacy of isoniazid in the prophylaxis against tuberculous meningitis. Not one of these 200 cases where tuberculous infection ranged from a positive tuberculin reaction to widespread pulmonary disease, exhibited a single symptom or sign which could be associated with any disease process. All were diagnosed by means of a routine tuberculin test or by a tuberculin test performed because of known contact with tuberculosis."

Many of the cases of so-called progressive primary tuberculosis exhibit minimal symptoms which may easily escape the attention of the parents and the clinician. To illustrate this, Dr. Kendig presents four cases of widespread pulmonary tuberculosis in children ranging from 19 days to 3 years of age. All diagnoses were established by skin tests because of known contact with cases of active tuberculosis. None of these had any significant symptoms except perhaps a slight low-grade fever.

The author concludes by saying, "It is apparent from the foregoing that the clinician is not justified in placing dependence on the symptoms or physical signs in the early diagnosis of pulmonary tuberculosis. The indicated procedure for early diagnosis appears to be the employment of the routine tuberculin test, but this is not generally utilized as might be desired. A survey conducted a few years ago among 2500 practicing pediatricians in the United States showed that among 1480 who answered the questionnaire only 821 (55.5%) employed the tuberculin test routinely; of these, 174 (21%) used the test after 3 years of age—too late to be of maximum case finding value.

"It is suggested, therefore, that a routine tuberculin test be done sometime during the first year of life, prior to smallpox vaccination if possible, because this is a suspected activator of tuberculous disease and annually thereafter. Only in this way is the early diagnosis of tuberculous disease in children possible. Use of the tuberculin test whenever a child has a known contact with tuberculosis, is, of course, mandatory."

(Kendig, E. L., Jr., Early Diagnosis of Tuberculosis in Childhood: Am. J. Dis. Child., 92: 558-561, December 1956)

Postgraduate Training in Preventive Medicine  
Leading to a Degree

An urgent need exists for medical officers trained in the basic disciplines of public health: epidemiology, biostatistics, microbiology, sanitary engineering, and public health administration.

Medical officers of the Regular Navy and Reserve officers who contemplate transfer to the Regular Navy or who have completed their obligated service and request extension of active duty for 2 years after completion of training, and who desire to specialize in preventive medicine, are invited to make immediate application for one academic year of postgraduate training beginning in August, September, or early October 1957. This training may be taken at any one of the accredited schools of public health in the United States offering a course leading to the degree of Master of Public Health or an equivalent certificate. Applications should be forwarded to the Chief of the Bureau of Medicine and Surgery via the commanding officer with reference to this article, and should be accompanied by an appropriate obligated service agreement in accordance with BuMed Instruction 1520.7A of 14 December 1956.

Several schools of public health also afford opportunity for specialized study in industrial health leading to the degree of Master of Industrial Health.

Among the interesting assignments available to young medical officers who successfully complete the course are: preventive medicine units ashore, both in the continental United States and in overseas areas; medical research units; preventive medicine duties at recruit training centers; the Bureau of Medicine and Surgery; and various Naval schools as instructors in such subjects as epidemiology, environmental health, preventive medicine, and related laboratory sciences. For those who major in industrial health, there are opportunities for assignment as industrial medical officers in the various Naval industrial activities. The basic courses are also of value to any medical officer interested in clinical research, aviation medicine, submarine medicine, preventive psychiatry, or various other facets of Navy medicine and are required by the American Board of Preventive Medicine for certification by examination in public health, aviation medicine, or occupational medicine. Furthermore, the broad knowledge and experience to be gained in a successful career in preventive medicine, whether it be in public health or in occupational health in the Navy, provide outstanding preparation for the responsibilities to be assumed with advancement in rank through the senior grades.

Candidates desiring more information on postgraduate training in preventive medicine are invited to direct their questions to the Bureau of Medicine and Surgery.

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Quarantine Diseases on the Decline

The years since the Second World War have seen a dramatic decline in the extent and severity of the so-called "quarantinable" diseases—cholera, plague, typhus, relapsing fever, smallpox, and yellow fever. These diseases are now mere shadows of their former menace.

It is against these diseases—the great "plagues" of history—that quarantine measures have been chiefly applied, both in the past and under present International Sanitary Regulations of the World Health Organization. These regulations which took effect just over 4 years ago replaced thirteen earlier and often conflicting Sanitary Conventions. They provide measures essential against the quarantinable diseases, but which cause the least possible obstruction to international traffic.

Since the regulations went into effect in October 1952, not a single epidemic of any of these diseases has occurred as a result of international travel. Only 45 ships and one aircraft have been reported as infected (i.e., carrying a person suspected of suffering from one of the quarantinable diseases).

That the regulations have proved satisfactory during the first 4 years of their existence is evidenced by the spirit in which they are being applied, the desire for mutual cooperation, understanding, and goodwill, and prevailing international agreement.

The recent history of each of the quarantinable diseases gives evidence of the dramatic improvement achieved in regard to them all.

Cholera in India. Although cholera has been endemic for centuries in India and probably also in China, no westward movement of the disease occurred until the 19th century when no fewer than six huge epidemic waves spread to nearly all parts of the world.

Since the 1920's, a striking change has taken place in the world distribution and spread of cholera, and since World War II the disease has made only brief excursions outside its central Asian stronghold. It appeared in Japan in 1946, in Egypt and Syria in 1947, and Indo-China in 1947-1952. In recent years, cholera has dwindled in importance to the point of being a problem only in its endemic foci in India and Pakistan (in the region of the Ganges and Brahmaputra deltas). Elsewhere, cholera has disappeared.

Even in its traditional home there has been a significant improvement. Cholera deaths have been recorded in India and Pakistan as follows:

1950 - 110,929	1953 - 133,830
1951 - 62,550	1954 - <u>18,000</u> (approximately)
1952 - 59,156	Total - 384,465

This approximate total of 385,000 deaths compares favorably with the 824,000 reported during the period 1945-1950 and is the lowest on record.

The declining importance of cholera throughout the world may be attributed almost entirely to better sanitary conditions in all countries which make it difficult for the infection to take hold. International transport by its nature is now unlikely to spread the infection.

Plague - An Ancient Scourge. The first record of a plague pandemic dates from the 6th century A. D., in the time of the Emperor Justinian. It was described as "one of the worst calamities that ever befell mankind." In the 14th century, the notorious Black Death killed millions of people in Europe and Asia and brought organized human society almost to an end. This second visitation lasted nearly 200 years.

Still another pandemic started in China in the latter half of the 19th century and was spread by maritime traffic to ports and countries all around the globe. The "plague spots" which continue to exist even today in parts of Asia, Africa, and the Americas are remnants of the epidemics of the last century. The present outlook is bright, however, and the disease in its human form has declined significantly.

General sanitary improvement has contributed to this situation and the new insecticides and rodenticides have helped to reduce the threat of infection. It must be remembered, however, that plague is essentially an animal infection, occasionally "spilling over" to humans. The problem of wild-rodent plague in certain countries remains as important as ever.

Typhus - Companion of War. Epidemic typhus is transmitted by the body-louse and has a calamitous record throughout the ages as the grim companion of war, famine, and catastrophe. It was expected to flare up again during World War II, but actually never got out of hand. Although there were serious outbreaks in North Africa, Yugoslavia, and Korea, they did not disorganize whole communities as in the past.

Today, typhus is disappearing from Europe and decreasing in Africa (except in Ethiopia where a large number of cases was reported in 1951-55). Until 1953, some of the countries of Latin America were still recording significant numbers of cases. In the Pacific area, the only serious outbreak in recent years was in Korea and resulted from war conditions. The position of some countries in Asia and Eastern Europe is not fully known. From the point of view of international travel, typhus retains little importance today.

Relapsing fever, also louse-borne, is the least well known of the quarantinable diseases. Never a serious problem in international travel, it is now on the decline everywhere. Europe has been free from it since 1949 and elsewhere there have been only sporadic cases in recent years. The exceptions are Cambodia (4261 cases in 1950), Korea (2738 cases in 1951, but only 25 in 1953) and Ethiopia where there were significant outbreaks in 1953, 1954, and 1955. To sum up, relapsing fever is today of little significance in international quarantine.

Decline of Smallpox. All epochs, regions, climates, and peoples have known smallpox. History, even up to very recent times, tells the sad story of its destructive effects. The situation tends to improve, however, as the following estimates show:

Average Number of Cases per Year

	<u>1946-50</u>	<u>1951-55</u>
Africa	33,000	25,000
Americas	20,000	9,000
Asia *	139,000	144,000
Europe **	687	119
Total (in round figures)	193,000	178,000

\*Excluding China and USSR

\*\*Excluding USSR, Albania, Bulgaria, Czechoslovakia, Hungary, Poland, and Rumania

For the past five years, 58% of all cases were reported from India and Pakistan, 23% from other countries of Asia, 14% from Africa south of the Sahara, and 5% from Latin America. The fact that the severe type of smallpox is now confined to certain endemic areas of the globe is evidence of the dramatic decrease of small pox. The persistence of endemic foci requires vigilance to prevent the infection from spreading elsewhere, but smallpox is no longer the threat it used to be even at the beginning of this century.

Yellow Fever. A disease of tropical Africa and America, yellow fever has in the past been known to invade Europe and North Africa, but has never spread to Asia. This is an epidemiological mystery, and one of the major considerations in present quarantine practice concerning this disease.

After centuries during which outbreaks of "yellow jack" periodically spread panic in two continents and was a continual hindrance to the development of new areas, the disease has today been restricted to a definable position. Thanks to mosquito eradication campaigns and widespread vaccination, control of yellow fever has now been successful over large areas.

Summary. Today, trends are clearly discernible with regard to the quarantinable diseases which give hope that cholera should be eliminated within the not too distant future; plague is no longer a problem in international traffic, but there must be no lowering of sanitary requirements for ships and ports, no relaxation of efforts to keep ships and warehouses free from rats; relapsing fever and typhus are now of little concern and the regulations which apply to them are effective; smallpox continues to be a nuisance in

international quarantine practice, but even this highly infectious disease is receding; yellow fever is the most serious problem in international quarantine; the fears of Asian countries concerning possible importation of this disease are legitimate, but there is cause for optimism in the success obtained in the Americas which shows that the disease can be suppressed from urban areas. (WHO Regional Office for South East Asia: SEAR 494, New Delhi, January 1957)

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#### Effect of Known Repeated Oral Doses of DDT in Man

It is generally recognized that the final evaluation of the toxicity of a chemical encountered by humans should be in terms of its effect in man. The following is a summary of the first experimental study of the storage, excretion, and possible clinical effects in man of DDT given in many small daily doses.

With full knowledge of the plan of the study and with complete freedom to withdraw at any time, 51 men volunteered to take daily oral doses of DDT for different intervals. One-third of the men received no DDT except that which occurred in the ordinary diet; one-third received 3.5 mg. per man per day; and one-third received 35 mg. per man per day which is about 200 times the daily rate at which an average man receives DDT from his diet. During the entire study, no volunteer complained of any symptom or showed by the tests used any sign of illness that did not have an easily recognized cause clearly unrelated to exposure to DDT.

The storage of DDT in man is proportional to dosage. There was an unexplained difference in the storage of recrystallized and of technical DDT. The pure material was stored in fat at an average concentration of 340 ppm, and the technical material at an average concentration of 234 ppm after an identical dosage of 35 mg. per man per day. It appears that at the dosages used, human males achieve maximum storage of DDT in about one year and thereafter store no more of the material despite continued intake. Men who ingested DDT showed an absolute increase in the storage of dehydrochlorinated DDT (DDE). No conclusion could be reached regarding the time at which equilibrium occurs in the storage of DDE. The storage of DDT and the storage of DDE show about the same relative variation (coefficient of variation) at different dosage levels, but the absolute variation is, of course, greater at higher dosages.

A method for determining the concentration of dichlorodiphenylacetic acid (DDA) in urine was perfected during the course of the study. The excretion of DDA is proportional to the dosage of DDT. This makes

possible an objective measurement of DDT absorption by the determination of DDA in urine and greatly expands the possibility of the practical study of formulators and others who have occupational exposure to DDT. It was possible to account for about 20% of the DDT administered in terms of DDA excreted in the urine. The results indicate that a large safety factor is associated with DDT as it now occurs in the general diet. (Hayes, W. J., Jr., Durham, W. F., Cueto, C., Jr., The Effect of Known Repeated Oral Doses of Chlorophenothane (DDT) in Man: J. A. M. A., 162:890-897, October 1956)

Note: It should be noted that this summary applies to oral doses only and does not necessarily apply to the potential toxicity of DDT when taken into the body by other routes—inhalaion, for example.

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#### Efficacy of Influenza Vaccine

An outbreak of influenza A occurred in an English boys' school in January and February of 1956. Of 664 boys present at the beginning of the outbreak, 200 had been vaccinated in December 1955 with a monovalent influenza A virus vaccine, and of these, 100 had been vaccinated in December 1954 with a polyvalent influenza A and B vaccine. One hundred and twenty additional boys had been vaccinated in 1954, but not in 1955, and 344 boys had not been vaccinated in either year. Admission rates for clinical influenza from these groups were:

<u>Group</u>	<u>Number in Group</u>	<u>Percentage Admitted with Influenza</u>
Unvaccinated	344	20%
Vaccinated 1954 only	120	12%
Vaccinated 1955 only	100	8%
Vaccinated both 1954 and 1955	100	2%

The outbreak was confirmed by virus isolation and serological methods. An analysis of noninfluenza respiratory diseases and other illnesses during the same period showed no significant differences between the groups.

The conclusion was reached that some protection remained from the 1954 inoculations (13-14 months prior to outbreak) and that a high degree of protection was obtained from the 1955 inoculations, particularly in boys who had been inoculated a year previously.

The virus A strains isolated during the epidemic were more closely related to the strains used in the 1954 vaccine than to the single strain used

in the 1955 vaccine. (Hawkins, G. F. C., Hatch, L. A., McDonald, J. C., Influenza Vaccination in a Residential Boys' School: Brit. M. J., No. 5003: 1200-1202, November 24, 1956)

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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